

SERIAL NO. 09/620,469

DOCKET NO. 1293.1132

IN THE CLAIMS:

Please **CANCEL** claims 5, 8, and 13 without prejudice or disclaimer, and **AMEND** claims 1, 18, and 21, as follows.

1. (CURRENTLY AMENDED) A phase change optical disc compatible with a recording beam and a reproducing beam, comprising:

a transparent substrate;

at least one first dielectric layer thinly formed on said transparent substrate;

a phase change recording layer which converts between the crystal phase and the amorphous phase by irradiation with the recording beam;

a reflective layer; and

a phase control layer disposed between said transparent substrate and said phase change recording layer, said phase control layer having two areas defined in a laser spot, the laser spot defined by where the reproducing beam is incident to said phase control layer,

wherein:

the irradiation with the reproducing beam of said phase control layer within the laser spot causes a phase difference due to one of the two areas changing between a crystal and an amorphous phase that alters an optical path of the reproducing beam reflected from said phase change recording layer so as to prevent portions of the reproducing beam reflected from said phase change recording layer from passing through the one area that has converted between the crystalline and the amorphous state,

said phase change recording layer does not change phases when irradiated by the reproducing beam,

the recording beam has a different optical power as compared to the reproducing beam, and

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the phase control layer ~~comprises a material selected from the group consisting essentially of GeSbTe, InSbTe, and~~ Ni.

2. (ORIGINAL) The phase change optical disc of claim 1, further comprising:

a second dielectric layer;

a third dielectric layer; and

a protective layer;

wherein said first dielectric layer, said phase control layer, said second dielectric layer, said phase change recording layer, said third dielectric layer, said reflective layer, and said protective layer are sequentially laminated on said transparent substrate.

3. (ORIGINAL) The phase change optical disc of claim 2, further comprising a fourth dielectric layer disposed between said reflective layer and said protective layer.

4-5. (CANCELED)

6. (ORIGINAL) The phase change optical disc of claim 3, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a maximum value of 180 degrees.

7-8. (CANCELED)

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9. (ORIGINAL) The phase change optical disc of claim 2, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a maximum value of 180 degrees.

10. (ORIGINAL) The phase change optical disc of claim 2, wherein each of said first, second, and third dielectric layers is formed of a material selected from the group consisting essentially of Al_2O_3 , ZnS-SiO_2 , Si_3N_4 , SiO_2 , MgF_2 , NaF_2 , LiF_2 , CaF_2 , and AlF_2 .

11. (PREVIOUSLY PRESENTED) The phase change optical disc of claim 2, wherein said phase change recording layer comprises a material selected from the group consisting essentially of GeSbTe , InSbTe , and AgInSbTe .

12-13. (CANCELED)

14. (ORIGINAL) The phase change optical disc of claim 1, wherein one of the two areas defined on said phase control layer has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a minimum value of 0 degrees, and the other area has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that has a maximum value of 180 degrees.

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15. (PREVIOUSLY PRESENTED) The phase change optical disc of claim 1, wherein said phase change recording layer comprises a material selected from the group consisting essentially of GeSbTe, InSbTe, and AgInSbTe.

16. (ORIGINAL) The phase change optical disc of claim 1, wherein each of said first, second, and third dielectric layers is formed of a material selected from the group consisting essentially of Al_2O_3 , ZnS-SiO_2 , Si_3N_4 , SiO_2 , MgF_2 , NaF_2 , LiF_2 , CaF_2 , and AlF_2 .

17. (ORIGINAL) The phase change optical disc of claim 1, wherein said reflective layer is formed of a material selected from the group consisting essentially of Al, Al-Ti, Cu, Au, and alloys of any of the above.

18. (CURRENTLY AMENDED) A phase change optical disc compatible with a recording beam and having multiple layers formed on a transparent substrate, the multiple layers including a reflective layer, comprising:

a phase change recording layer which converts between the crystal phase and the amorphous phase by irradiation with the recording beam; and

a phase control layer disposed between the transparent substrate and said phase change recording layer, said phase control layer having a plurality of areas defined in a laser spot, the laser spot defined by where the reproducing beam is incident to said phase control layer,

wherein:

the irradiation of the laser spot on said phase control layer with the reproducing beam causes a phase difference in the plurality of areas on said phase control layer due to ones of the plurality of areas being converted between a crystalline and an amorphous state that alters an optical path of the reproducing beam reflected from said phase change recording layer

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so as to prevent portions of the reproducing beam reflected from said phase change recording layer from passing through the ones of the areas that have converted between the crystalline and the amorphous state,

said phase change recording layer does not change phases when irradiated by the reproducing beam,

the recording beam has a different optical power as compared to the reproducing beam, and

the phase control layer ~~comprises a material selected from the group consisting essentially of GeSbTe, InSbTe, and is~~ Ni.

19. (ORIGINAL) The phase change optical disc of claim 18, wherein a material that forms said phase control layer defines the plurality of areas based upon a temperature profile of the material during irradiation by the reproduction beam.

20. (ORIGINAL) The phase change optical disc of claim 18, wherein the plurality of areas comprise at least one area that has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially has a value of 0 degrees, and at least one other area which has a phase difference, which alters an optical path of the reproducing beam reflected from said phase change recording layer, that substantially which substantially has a value of 180 degrees.

21. (CURRENTLY AMENDED) An optical disc compatible with a reproducing beam and having multiple layers formed on a transparent substrate, comprising:

a recording layer having recording marks to be reproduced using the reproducing beam forming a first laser spot on said recording layer; and

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a phase control layer disposed between the transparent substrate and said recording layer upon which the reproducing beam forms a second laser spot,

wherein:

the irradiation of the second laser spot on said phase control layer causes one area of said phase control layer within the second laser spot to be converted between a crystalline and an amorphous state so as to alter an optical path of a portion of the reproducing beam received at the recording layer such that the second laser spot is larger than the first laser spot, and

the phase control layer comprises a material selected from the group consisting essentially of ~~GeSbTe, InSbTe, and~~ Ni.

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P.O. Box 1450, Alexandria, VA 22313-1450

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STAAS & HALSEY

By: Lauren E. Ponder

Date: 2 April 04

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